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AN EFFICIENT METHOD OF BROADCASTING RANGE GRASS SEEDS

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A new method of mechanically broadcasting grass seed was given field trials in 1943 on range land in northern Nevada. An examination of each seeded area disclosed moderately uniform distribution of seed. Seeding by the new method is more rapid and costs are materially reduced in comparison with hand methods of broadcasting. Although drilling is a more efficient method of seeding, physical conditions of range land limit its use so that broadcasting is often necessary.

Description of Power Seeder

Mr. B. W. Mabee of Elko, Nevada made available for experimental seeding the numerous types of power spreaders devised by the Bureau of Entomology and Plant Quarantine to scatter bait for poisoning insects. Two of the three types tested on range reseeding projects were found suitable.

The most satisfactory type consists of a hopper from which seed falls through slots, the size of which is adjustable, into a blower driven by a small gasoline motor. The hopper, blower, and motor are mounted on an angle-iron frame, the whole unit weighing 120 pounds. With a bladelike agitator attached to the end of the blower shaft just above the slot feed, it is possible to control the rate of seed flow more precisely than can be done with the conveyor-chain type of feed. In these tests the blower type of seed distributor scattered seeds more uniformly in a strong wind than did the rotating disk type.

The seeder illustrated in figures 1 and 2 is easily adapted for use with the various kinds of equipment employed in eradication of brush and in preparation of seedbed. It can be mounted on a tractor, as in figure 3, on a tillage implement, or in a trailer, either parallel or at right angles to the direction of travel.

On those projects where seed would otherwise be scattered by hand, this seeder can be used at a saving in wages of 25 to 50¢ per acre, depending upon the wage scale and the acreage covered. With reasonable care in adjustment it will distribute seed more uniformly and at a more constant rate than is possible by hand seeding.

Several other types of mechanical bait spreaders might be adapted for the broadcasting of seed under certain conditions. Some of these spreaders are powered from a wagon wheel or through the vertically raised drive shaft of the rear-axle assembly of an automobile. Five of these homemade bait spreaders are described and illustrated in Farmers' Bulletin No. 54 of the Canadian Department of Agriculture. One of them is also illustrated in USDA Farmers' Bulletin No. 1828.

Field Tests

The seeder here recommended was used by the Humboldt National Forest in connection with a wheatland plow by mounting it on the side of a crawler-type tractor at right angles to the direction of travel. The desired seeding rate of 10 pounds per acre was easily obtained by adjusting the slot openings to the speed of the tractor. The width to which seed was spread was controlled by adjusting the speed of the motor. Several 6-inch strips of canvas were tied to the end of the blower spout to secure uniform seed distribution over the 8-foot strip turned up by the plow on the previous round.

The same seeder was in another case mounted parallel with the direction of travel on the rear end of a wheel tractor which pulled a log harrow. In order to increase the spread of seed to the 7½-foot width of the harrow a galvanized iron "fishtail" was bolted to the bottom of the blower spout and flared upward. In a strong wind, when the spread is too great or irregular, the fishtail should be attached to the top of the blower spout and made to flare downward.

Another bait spreader with a rotating-disk seed distributor and slot feed was thoroughly tested by the U. S. Grazing Service in the Elko Grazing District in Nevada. It was mounted on a trailer towed behind a wheatland plow. The comment of Grazier Gerald F. Trescartes follows: "One of the greatest disadvantages...was seeding in the wind, but I would say that it is not too serious... No trouble was experienced with the feed plugging up, and we adjusted it for seeding 3.4 lbs. of western wheatgrass per acre, which was carried out uniformly throughout the seeding program." He mentions the following advantages, "...simplicity of design and construction which gave no mechanical trouble, also the large hopper could be filled and practically forgotten. Rough ground did not affect its operation." He makes several suggestions for improving the model, e.g., increasing the rotating speed of the disk to widen the spread of seed and to counteract wind action.

The visible feed of these seeders is a distinct advantage, as it enable the tractor operator to see at a glance whether the distributor is functioning. Its freer feed permits the use of awned seed and of seed which has not been cleaned thoroughly enough to use in the seeder boxes of drills, wide-track broadcast seeders, or tiller combines.1/

1/ Wheatland-type plow with seeder box attached.

Cost of Broadcasting

Theoretically, range land can be seeded broadcast by hand or hand seeder for 10 to 30¢ an acre. This is assuming a 10-foot spread at speeds of 2 to 5 m.p.h. and wages at $5.00 per day. Actually costs are rarely so low because of higher wages, or working less than 8 hours, or more important, the practice of broadcasting from heavy, slow-moving equipment.

On one project three men walking with hand seeders covered 100 acres at a cost of 36¢ per acre. On another project in 1943 two (cost 55¢ per acre) men spent 11 man-days in distributing seed on 200 acres. On two other projects the full time of a man was used in broadcasting 1.5 (cost 51¢ per acre) and 1.6 acres per hour where brush was being eradicated with a wheatland plow.

The original cost of this power seeder lies chiefly in the motor and the labor required for construction. The operating cost is 25 to 50¢ per day, and with proper servicing of the motor, amortization may be over a period of 10 years.

Recommendation

Since these machines are more capable than a man of broadcasting seed uniformly, rapidly, and economically, operators contemplating doing large-scale seeding may wish to obtain enough of them to replace hand broadcasting. If this is done, it will release manpower for such jobs as mixing seed, servicing equipment, hauling posts, or fence construction which are normally done in conjunction with range reseeding. It may make possible the initiation or continuance of work on projects where a crew of only one man is obtainable.

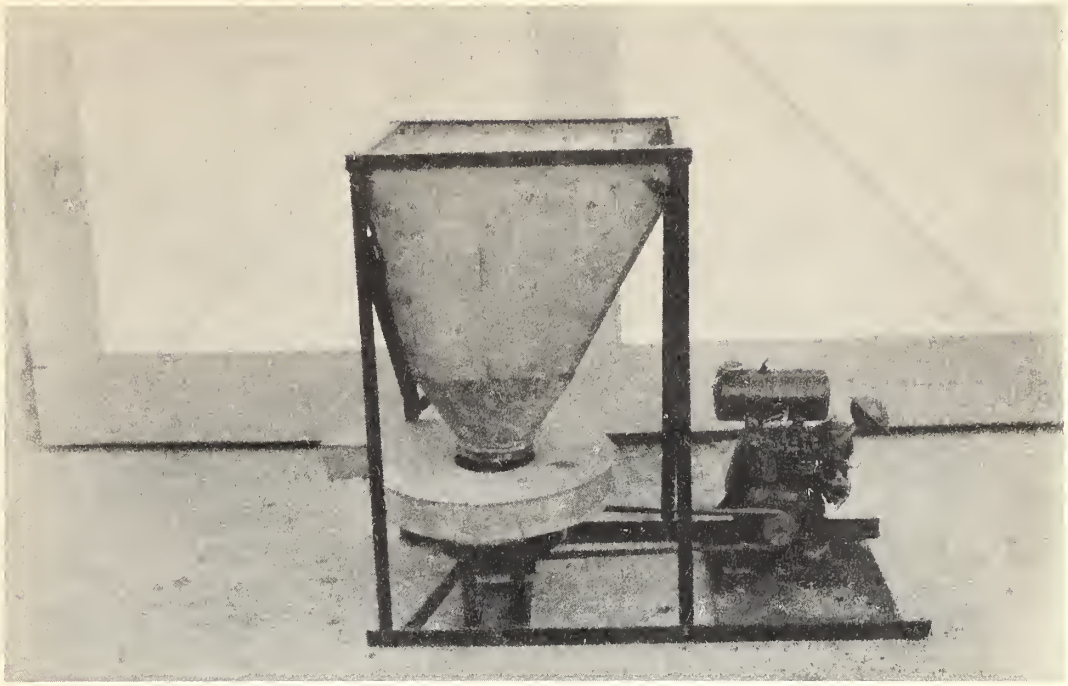

Figure 1. Side view of the best adapted type of motorized broadcast seeder showing positions of hopper, blower, and 1-horse-power motor. This device was built by the Bureau of Entomology and Plant Quarantine.

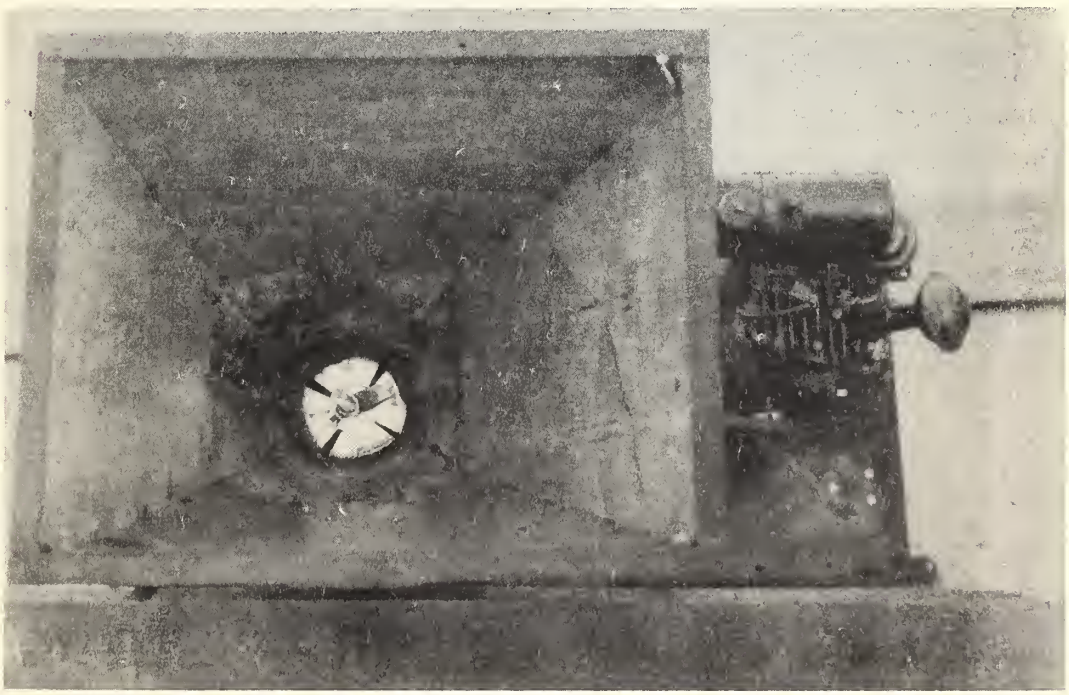

Figure 2. Interior view of the seed hopper showing the feed slots and the top of the blower shaft with seed agitator attached.

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Figure 3. A motorized broadcast seeder mounted on the rear of a tractor where it is operated by the tractor driver. This seeding device was used in a demonstration planting in cooperation with the U. S. Grazing Service near Winnemucca, Nevada.

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